

Appln. No. 10/035,421
Amendment dated July 18, 2003
Reply to Office action of April 22, 2003
Replacement Sheet

ABSTRACT OF THE DISCLOSURE

Disclosed is a freeze-drying apparatus for foodstuffs, medicaments, etc., wherein liquid material is directly and distributively poured into upright cylindrical tubes, then, in its isolated state from external atmosphere for perfect sterilization, the liquid material is frozen with uniform thickness onto inner wall surface of the tubes, with further possibility of uniform heating of the freeze-dried layer. The main body of this apparatus is constructed with upright cylindrical tubes for freezing liquid material onto inner surface of tubes and jackets to surround the outer periphery of each of the ~~tubers~~tubes in a substantially concentric cylindrical shape, within which to circulate heat medium; then, a duct communicating to the vacuum exhaust system is connected to the upper end side of these tubes, while, a recovery chamber provided with valve is connected to the lower end side of tubes; and an inlet port is defined for feeding liquid material into inner cavity of tubes.